Standard Costs and Variances

Chapter 10

Standard Costs

Standards are benchmarks or "norms" for measuring performance. In managerial accounting, two types of standards are commonly used.

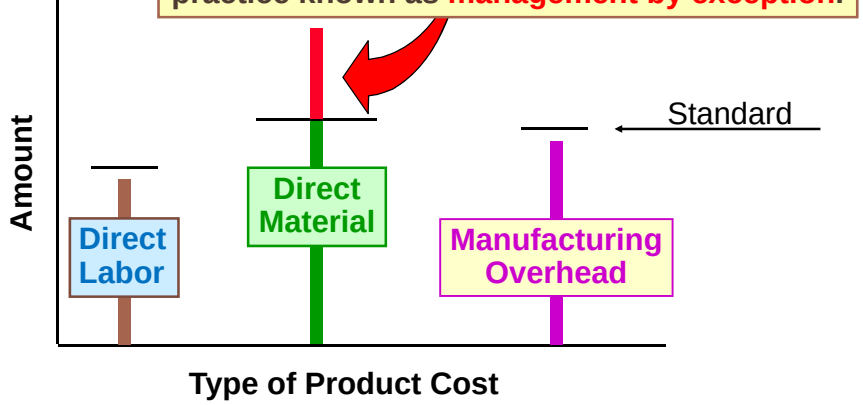
Quantity standards specify how much of an input should be used to make a product or provide a service.

Price standards specify how much should be paid for each unit of the input.

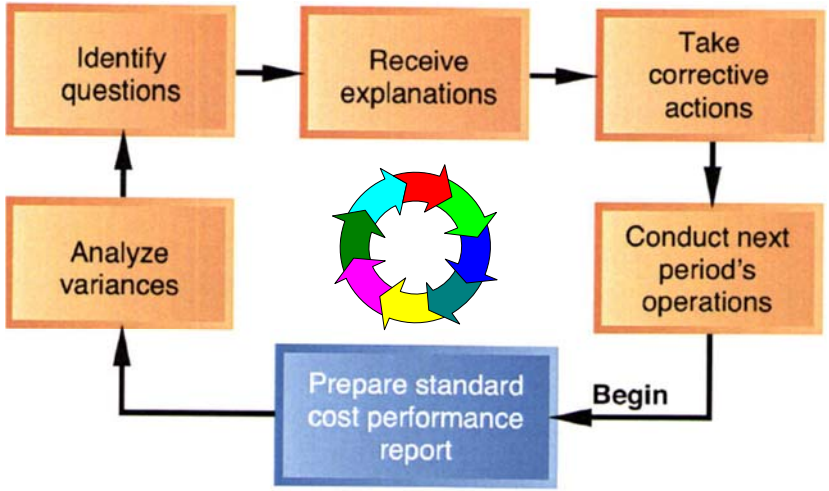
Examples: Firestone, Sears, McDonald's, hospitals, construction, and manufacturing companies.

Standard Costs

Deviations from standards deemed significant are brought to the attention of management, a practice known as management by exception.



Variance Analysis Cycle



Setting Standard Costs

Should we use ideal standards that require employees to work at 100 percent peak efficiency?

I recommend using practical standards that are currently attainable with reasonable and efficient effort.

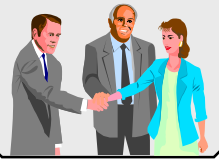
Engineer

Managerial Accountant

Setting Direct Materials Standards

Standard Price per Unit

Final, delivered cost of materials, net of discounts.



Standard Quantity per Unit

Summarized in a Bill of Materials.

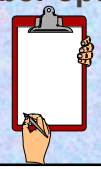
Setting Direct Labor Standards

Standard Rate per Hour

Often a single rate is used that reflects the mix of wages earned.

Standard Hours per Unit

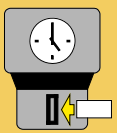
Use time and motion studies for each labor operation.



Setting Variable Manufacturing Overhead Standards

Price Standard

The rate is the variable portion of the predetermined overhead rate.



Quantity Standard

The quantity is the activity in the allocation base for predetermined overhead.

The Standard Cost Card

A standard cost card for one unit of product might look like this:

Inputs	A Standard Quantity or Hours	B Standard Price or Rate	A x B Standard Cost per Unit
Direct materials	3.0 lbs.	$ 4.00 per lb.	$ 12.00
Direct labor	2.5 hours	14.00 per hour	35.00
Variable mfg. overhead	2.5 hours	3.00 per hour	7.50
Total standard unit cost			$ 54.50

Using Standards in Flexible Budgets

Standard costs per unit for direct materials, direct labor, and variable manufacturing overhead can be used to compute **activity** and **spending** variances.

Spending variances become more useful by breaking them down into quantity and price variances.

A General Model for Variance Analysis

Variance Analysis

- Quantity Variance → **Difference between actual quantity and standard quantity**
- Price Variance → **Difference between actual price and standard price**

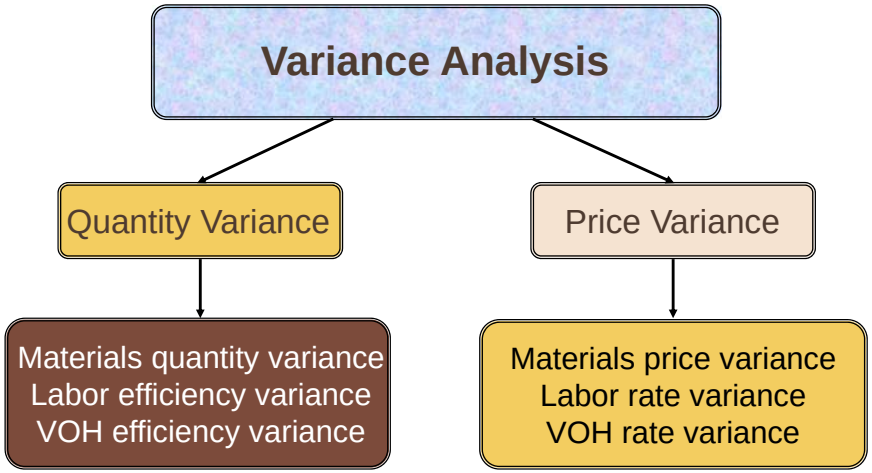
Quantity and Price Standards

Quantity and price standards are determined separately for two reasons:

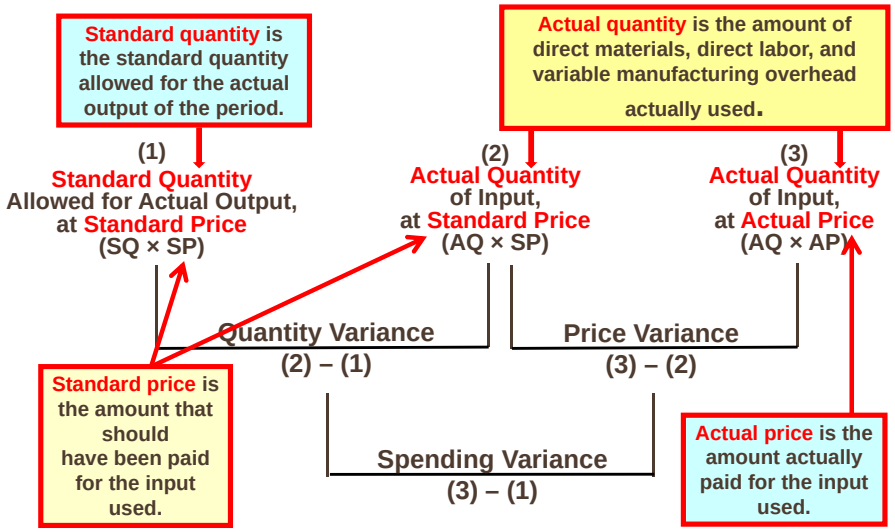
❶ The purchasing manager is responsible for raw material purchase prices and the production manager is responsible for the quantity of raw material used.

❷ The buying and using activities occur at different times. Raw material purchases may be held in inventory for a period of time before being used in production.

A General Model for Variance Analysis



A General Model for Variance Analysis



Materials Variances – An Example

Glacier Peak Outfitters has the following direct materials standard for the fiberfill in its mountain parka.

0.1 kg. of fiberfill per parka at $5.00 per kg.

Last month 210 kgs. of fiberfill were purchased and used to make 2,000 parkas. The materials cost a total of $1,029.

Materials Variances Summary

Standard Quantity × Standard Price	Actual Quantity × Standard Price	Actual Quantity × Actual Price
200 kgs.	210 kgs.	210 kgs.
×	×	×
$5.00 per kg.	$5.00 per kg.	$4.90 per kg.
= $1,000	= $1,050	= $1,029

Quantity variance
$50 unfavorable

Price variance
$21 favorable

Materials Variances: Using the Factored Equations

Materials quantity variance

MQV = (AQ × SP) – (SQ × SP)
= SP(AQ – SQ)
= $5.00/kg (210 kgs – (0.1 kg/parka × 2,000 parkas))
= $5.00/kg (210 kgs – 200 kgs)
= $5.00/kg (10 kgs) = $50 U

Materials price variance

MPV = (AQ × AP) – (AQ × SP)
= AQ(AP – SP)
= 210 kgs ($4.90/kg – $5.00/kg)
= 210 kgs (– $0.10/kg) = $21 F

Responsibility for Materials Variances

Materials Quantity Variance

Materials Price Variance

The standard price is used to compute the quantity variance so that the production manager is not held responsible for the purchasing manager's performance.

Responsibility for Materials Variances

I am not responsible for this unfavorable materials quantity variance.

You purchased cheap material, so my people had to use more of it.

Your poor scheduling sometimes requires me to rush order materials at a higher price, causing unfavorable price variances.

Labor Variances – An Example

Glacier Peak Outfitters has the following direct labor standard for its mountain parka.

1.2 standard hours per parka at $10.00 per hour

Last month, employees actually worked 2,500 hours at a total labor cost of $26,250 to make 2,000 parkas.

Labor Variances Summary

Standard Hours × Standard Rate	Actual Hours × Standard Rate	Actual Hours × Actual Rate
2,400 hours × $10.00 per hour	2,500 hours × $10.00 per hour	2,500 hours × $10.50 per hour
= $24,000	= $25,000	= $26,250

Efficiency variance
$1,000 unfavorable

Rate variance
$1,250 unfavorable

Labor Variances: Using the Factored Equations

Labor efficiency variance

LEV = (AH × SR) – (SH × SR)
= SR (AH – SH)
= $10.00 per hour (2,500 hours – 2,400 hours)
= $10.00 per hour (100 hours)
= $1,000 unfavorable

Labor rate variance

LRV = (AH × AR) – (AH × SR)
= AH (AR – SR)
= 2,500 hours ($10.50 per hour – $10.00 per hour)
= 2,500 hours ($0.50 per hour)
= $1,250 unfavorable

Responsibility for Labor Variances

Production managers are usually held accountable for labor variances because they can influence the:

- Mix of skill levels assigned to work tasks.
- Level of employee motivation.
- Quality of production supervision.
- Quality of training provided to employees.

Responsibility for Labor Variances

I am not responsible for the unfavorable labor efficiency variance!

You purchased cheap material, so it took more time to process it.

I think it took more time to process the materials because the Maintenance Department has poorly maintained your equipment.

Variable Manufacturing Overhead Variances – An Example

Glacier Peak Outfitters has the following direct variable manufacturing overhead labor standard for its mountain parka.

1.2 standard hours per parka at $4.00 per hour

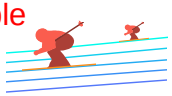
Last month, employees actually worked 2,500 hours to make 2,000 parkas. Actual variable manufacturing overhead for the month was $10,500.

Variable Manufacturing Overhead Variances Summary

Standard Hours × Standard Rate	Actual Hours × Standard Rate	Actual Hours × Actual Rate
2,400 hours ×	2,500 hours ×	2,500 hours ×
$4.00 per hour	$4.00 per hour	$4.20 per hour
= $9,600	= $10,000	= $10,500

Efficiency variance $400 unfavorable

Rate variance $500 unfavorable



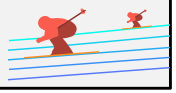
Variable Manufacturing Overhead Variances: Using Factored Equations

Variable manufacturing overhead efficiency variance

VMEV = (AH × SR) – (SH – SR)
= SR (AH – SH)
= $4.00 per hour (2,500 hours – 2,400 hours)
= $4.00 per hour (100 hours)
= $400 unfavorable

Variable manufacturing overhead rate variance

VMRV = (AH × AR) – (AH – SR)
= AH (AR – SR)
= 2,500 hours ($4.20 per hour – $4.00 per hour)
= 2,500 hours ($0.20 per hour)
= $500 unfavorable



Materials Variances—An Important Subtlety

The quantity variance is computed only on the quantity used.

The price variance is computed on the entire quantity purchased.

Materials Variances—An Important Subtlety

Glacier Peak Outfitters has the following direct materials standard for the fiberfill in its mountain parka.

0.1 kg. of fiberfill per parka at $5.00 per kg.

Last month 210 kgs. of fiberfill were purchased at a cost of $1,029. Glacier used 200 kgs. to make 2,000 parkas.

Materials Variances—An Important Subtlety

Standard Quantity × Standard Price	Actual Quantity × Standard Price
200 kgs. × $5.00 per kg.	200 kgs. × $5.00 per kg.
= $1,000	= $1,000

Quantity variance
$0

Materials Variances—An Important Subtlety

Actual Quantity × Standard Price	Actual Quantity × Actual Price
210 kgs. × $5.00 per kg.	210 kgs. × $4.90 per kg.
= $1,050	= $1,029

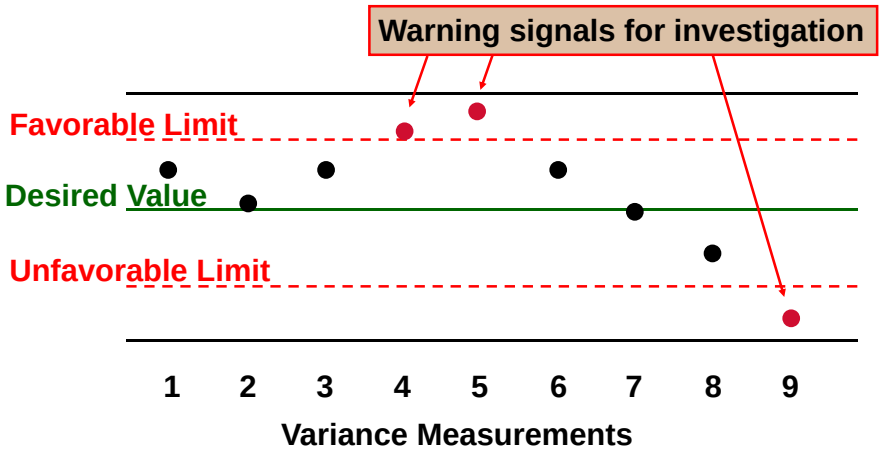
Price variance
$21 favorable

Variance Analysis and Management by Exception

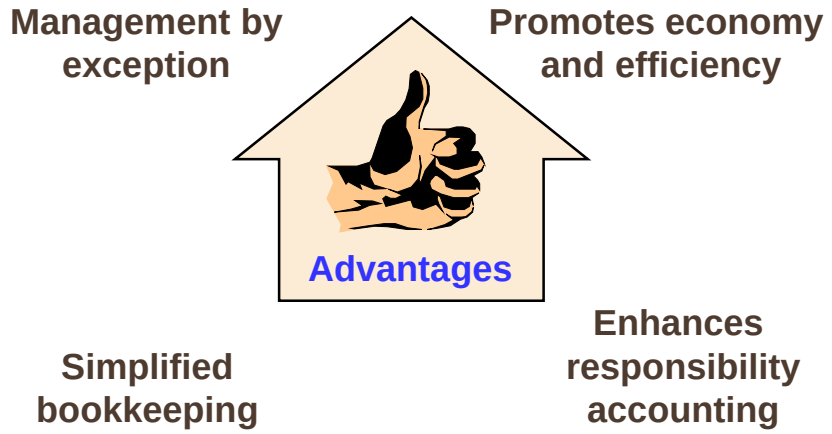
How do I know which variances to investigate?

Larger variances, in dollar amount or as a percentage of the standard, are investigated first.

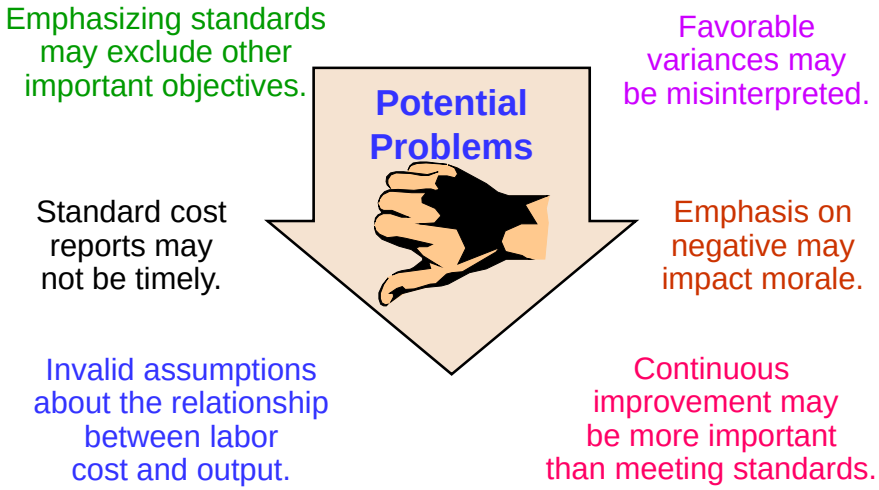
A Statistical Control Chart



Advantages of Standard Costs



Potential Problems with Standard Costs



End of Chapter 10